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(54) INTERLAYER MATERIAL FOR THREE-LAYER RESIST AND PATTERN FORMING METHOD

(57)Abstract:

PURPOSE: To form an upper layer resist film uniform in film thickness by forming an interlayer composed essentially of specified organopolysiloxane and incorporating an organic peroxide as a cross-linking agent to form a 3-layer resist.

CONSTITUTION: The interlayer of the 3-layer resist is composed essentially of organopolysiloxane represented by the formula shown on the right in which each of R is optionally same or different, and each is H, OH, alkoxy, or a hydrocarbon group; m+n+p+q=1, m>0, n, p, q≥0, m/q≤1 (q>0), m/p≤0.3 (p>0), and p and q are simultaneously not 0. Further, the cross-linking agent containing the organic peroxide is incorporated in the interlayer. A substrate pattern is formed by using the 3-layer resist as follows: Spin coating the semiconductor substrate 1 with a lower layer resist 2 made of an organic polymer, then heat treating it, spin coating the lower layer 2 with the interlayer material 3 composed of the organopolysiloxane containing a prescribed amount of organic peroxide, heat treating it, spin coating the interlayer 3 with an upper layer resist 4 made of a polymer to be cross-linked or decomposed by radiation, and finally heat treating it, thus permitting the good upper layer resist 4 uniform in thickness to be formed by using this interlayer.